April 15, 1949.

Dr. F. H. Stodola,
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U. S. D. A.,
Peoria, Illinois.

Dear Frank,

I thought I was going to Detroit, where I expected to see you, but changed my mind, and decided to write you instead.

You may remember that I asked you once for some lactobionate to help try to work out a scheme for lactose utilization that would be complicated enough to squeeze in half a dozen enzymes to correspond the an equivalent number of genes that we had found to control lactose fermentation. I think that we have pretty good evidence that galactosidase is the only relevant enzyme, and that the complex genetic control with its implications of a many to many rather than a one-to-one relationship of gene-to-enzyme, has to do with the complex adaptive mechanism. Lactobionate has turned out to be uniquely interesting in this respect, as it seems to evoke galactosidase although it does not combine with the enzyme. But, and you've probably guessed at this, I've run out of the material that you sent me. KP Link had some very old crude stuff that I've been working with, but I don't trust it.

If you can spare it, I wonder if you could manage 10 - 20 gms of the cruder material that you sent me as NRRL 2512-29-A, or equivalent, and possibly half a gram or so of the more purified 2378-7-A for kinetic competitive inhibition studies.

This result, if verified would definitely separate the specificity of adaptation from that of the enzyme produced. Conversely, a mutant was picked up which will not adapt to lactose, but when grown on butyl galactoside, the harvested cells contain galactosidase and will ferment lactose!

The important point with respect to lactobionate is not merely that it evokes galactosidase although it is not <u>utilized</u> by the enzyme, but that it does not so much as react with it, as determined by competition for the enzyme with o-nitrophenyl galactoside which we are using as a chromogenic substrate. However, I have to check this result with galactosidase from cells grown on the lactobionate, which unfortunately takes a fair amount of material.

If, perchance, you are going to the S.A.B. meeting in Cinncinnati next month I'll try to look you up.

Sincerely,

Joshua Lederberg.